

$$D_{f(x)} = [-2, 4] \rightarrow -2 \leq \frac{3x+2}{5} \leq 4 \rightarrow -10 \leq 3x+2 \leq 20$$

$$\rightarrow -12 \leq 3x \leq 18 \rightarrow -4 \leq x \leq 6 \rightarrow D = [-4, 6]$$

$$f\left(\frac{3x+2}{5}\right)$$

$$D = [-2, 4] \rightarrow -2 \leq x \leq 4 \rightarrow -4 \leq 3x \leq 12 \rightarrow -8 \leq 3x-2 \leq 10$$

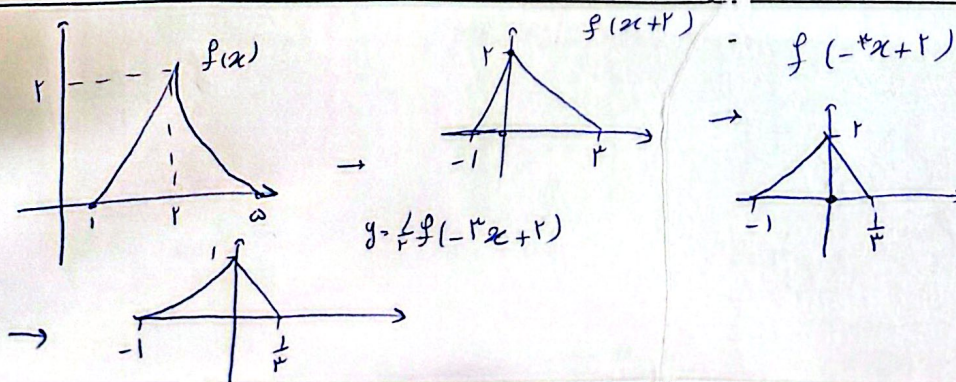
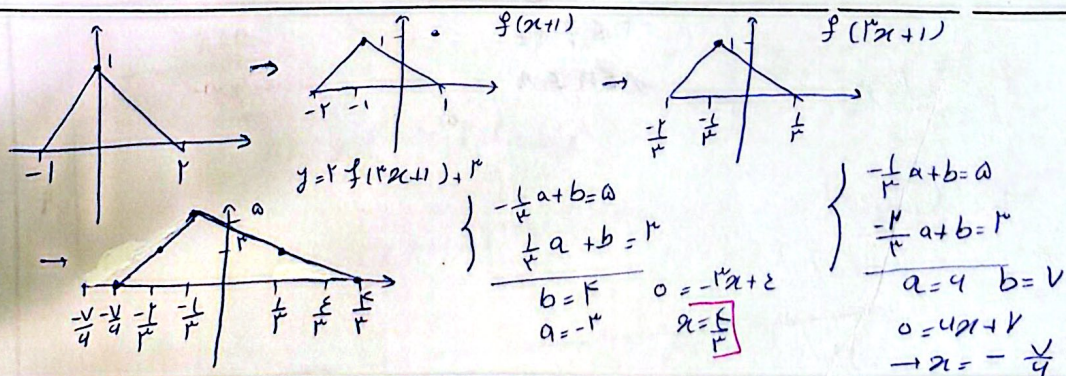
$$D_{f(x)} = [-8, 10]$$

$$D_{f\left(\frac{3x+1}{2}\right)} = [-2, 4] \rightarrow -2 \leq \frac{3x+1}{2} \leq 4 \rightarrow -4 \leq 3x+1 \leq 8$$

$$\rightarrow -5 \leq 3x \leq 7 \rightarrow -\frac{5}{3} \leq x \leq \frac{7}{3}$$

$$\rightarrow \frac{7}{3} \geq x \geq -\frac{5}{3}$$

$$\left[-\frac{5}{3}, \frac{7}{3}\right]$$



$$y = -\frac{1}{r}x^2 + \frac{1}{a}x + 1 \rightarrow 0 \quad \left| \quad x = \frac{-b}{2a} = \frac{-\frac{1}{a}}{-\frac{2}{r}} = \frac{r}{2a}$$

$$y = \frac{1}{a}$$

$$\frac{y(0)}{(0, r)} \rightarrow y = -\frac{1}{r}(x-1)^2 + 1 \rightarrow -\frac{1}{r}(x-1)^2 + 1 = 0 \rightarrow (x-1)^2 = r$$

$$\rightarrow x-1 = \pm \sqrt{r} \quad \left\{ \begin{array}{l} x=1 \\ x=1+\sqrt{r} \end{array} \right.$$

$$f^{-1}(1, r) = (1, r) \rightarrow f(r(x+1)) = f(1) \rightarrow r(x+1) = 1 \rightarrow rx = -1 \rightarrow x = -\frac{1}{r} = \alpha$$

$$y = 1 - r f(r(x+1)) \quad x = -\frac{1}{r} \quad y = 1 - r f(1) = 1 - r = -r = \beta$$

$$\alpha \beta = \frac{1}{r}$$

$$D_f = (a, r] \quad D_g = [-1, b) \rightarrow f(x-1) \Rightarrow a < x-1 \leq r$$

$$a+1 < x \leq r+1$$

$$D_g \rightarrow -1 \leq x+1 < b \rightarrow -r \leq x < b-1$$

$$D_g(x+1) \quad (a+1, r+1] \cap [-r, b-1) = (-r, a) \rightarrow \left\{ \begin{array}{l} a+1 = -r \rightarrow a = -r-1 \\ b-1 = r+1 \rightarrow b = r+2 \end{array} \right.$$

$$a-b = -9$$

$$D_{f(x)+1} = [-r, r] \rightarrow D_{f(x)} \quad \frac{-r}{r} \leq \frac{x}{r} \leq \frac{r}{r} \rightarrow \frac{-1}{r} \leq \frac{x}{r} + 1 \leq \frac{1}{r} \rightarrow D = \left[-\frac{1}{r}, \frac{1}{r} \right] = D$$

$$R_{f(x)+1} = R_{f(x)} = [-1, r] \quad f(x) \in [-1, r] \rightarrow \omega \leq r f(x) - r \leq 1$$

$$\rightarrow 0 \leq |r f(x) - r| \leq \omega \rightarrow 0 \leq \sqrt{1 f(x) + 1} \leq \sqrt{\omega}$$

$$R_{\sqrt{1 f(x) + 1}} = [0, \sqrt{\omega}]$$

$$f(x) = \left| \frac{x+1}{r(x+1)} \right| \xrightarrow{\text{بسط و جداسازی}} \left| \frac{(x-1)+1}{r(x-1)+1} \right| = \left| \frac{x-1}{r(x-1)} \right| \xrightarrow{\text{بسط و جداسازی}} g = \left| \frac{x-1}{r(x-1)} \right| + 1$$

$$x + \left| \frac{x-1}{r(x-1)} \right| + 1 < 0 \rightarrow \left| \frac{x-1}{r(x-1)} \right| < -x-1 \rightarrow -x-1 > 0 \rightarrow x < -1$$

$$-(-x-1) < \frac{x-1}{r(x-1)} < -x-1 \rightarrow x+1 < \frac{x-1}{r(x-1)} \rightarrow \frac{rx^2 - rx - 1}{rx - r} < 0$$

$$\rightarrow x < \frac{1-\sqrt{\omega}}{r} \quad \frac{x-1}{r(x-1)} < -x-1 \rightarrow \frac{rx^2 - rx - 1}{rx - r} < 0 \rightarrow x < -\sqrt{r}$$

$$\Phi \cap \Phi = x \in (-\sqrt{\omega}, -\sqrt{r})$$